

SINLOON®

AEC-Q200 高阻值貼片電阻
Resistance Range: 10M- 100M Ω

AQHR Series
AEC-Q200 High ohm Chip Resistor

□ FEATURE

- ◆ AEC-Q200 rev. D compliant
- ◆ RoHS compliant version available
- ◆ Leadless surface mount construction
- ◆ Reliability high quality and fast delivery
- ◆ Reduction of assembly costs matching with placement machines
- ◆ Tolerance: ±1% , ±5%; Rated power 2W - 2512.

□ Application

- ◆ Automotive electronic
- ◆ Appliance: Air conditioner, Refrigerator
- ◆ Entertainment: Stereo, TV tuners, Tape recorder.
- ◆ Indoor lighting, Central door locking, Wiper module
- ◆ Communication equipment: Cell phone, Fax machine
- ◆ Power equipment: Power supply, illumination equipment.
- ◆ Measuring instrument: Electric meter, Navigation equipment.

□ Ordering Information

Example: AQHR03JF107

| Power | Size | Type | Tolerance | TCR/°C | Resistance (E24) | Package |
|-------|------|--------|---------------------|----------|---|---------|
| 1/8W | 0603 | AQHP03 | J = ±5% K = ±10% | ppm | 100K=104 1M=105 10M=106 100M=107 | 5K Reel |
| 1/4W | 0805 | AQHP05 | | E = ±100 | | 5K Reel |
| 1/2W | 1206 | AQHP06 | | F = ±200 | | 5K Reel |
| 4/6W | 1210 | AQHP10 | | G = ±300 | | 5K Reel |
| 1W | 1812 | AQHP12 | | H = ±400 | | 5K Reel |
| 1W | 2010 | AQHP20 | | | | 5K Reel |
| 2W | 2512 | AQHP25 | | | | 4K Reel |

□ Dimension

Unit: mm

| Power | Size | Type | L | W | H | D1 | D2 | Figure |
|-------|------|--------|------------|------------|------------|-----------|-----------|--------|
| 1/8W | 0603 | AQHP03 | 1.6±0.15 | 0.80±0.10 | 0.45±0.10 | 0.30±0.20 | 0.30±0.20 | Fig-1 |
| 1/4W | 0805 | AQHP05 | 2.0±0.15 | 1.25±0.10 | 0.50±0.10 | 0.35±0.20 | 0.40±0.20 | Fig-1 |
| 1/2W | 1206 | AQHP06 | 3.1±0.10 | 1.55±0.10 | 0.55±0.10 | 0.45±0.20 | 0.40±0.20 | Fig-1 |
| 4/6W | 1210 | AQHP10 | 3.1±0.10 | 2.55±0.10 | 0.55±0.10 | 0.50±0.20 | 0.50±0.20 | Fig-1 |
| 1W | 1812 | AQHP12 | 4.50 ±0.20 | 3.00 ±0.20 | 0.55 ±0.10 | 0.45±0.20 | 0.40±0.20 | Fig-1 |
| 1W | 2010 | AQHP20 | 5.0±0.20 | 2.50±0.20 | 0.55±0.10 | 0.60±0.20 | 0.50±0.20 | Fig-1 |
| 2W | 2512 | AQHP25 | 3.1±0.10 | 4.60±0.20 | 0.55±0.10 | 0.45±0.20 | 0.40±0.20 | Fig-1 |

Fig-1

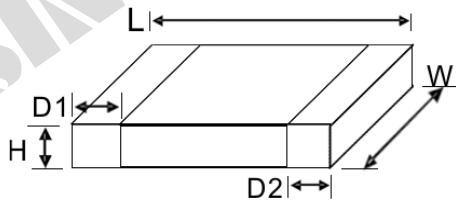


Fig-2

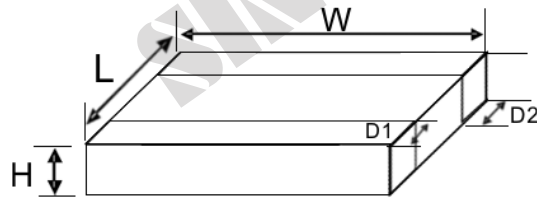
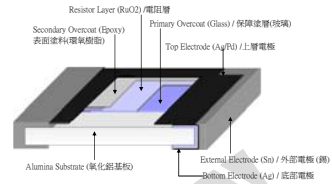


Figure:



Construction



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AQHR Series

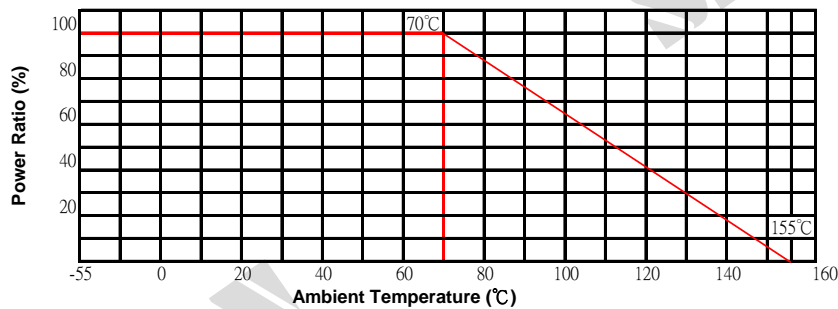
Resistance Range: 10M- 100M Ω

AEC-Q200 High ohm Chip Resistor

□ Standard General Electrical Specification

| Rated at 70°C | Case | Type | Max. Voltage | | Resistance Range (Ω) | Tolerance | T.C.R (ppm/°C) | Jumper Current |
|------------------------------|------|--------|--------------|----------|----------------------|-----------|----------------|----------------|
| | | | Working | Overload | | | | |
| 1/8W | 0603 | AQHP03 | 50V | 100V | 10M-54M | ±1% | ±200 | 1A |
| | | | | | 10M-100M | ±5% | | |
| 1/4W | 0805 | AQHP05 | 50V | 100V | 10M-54M | ±1% | ±200 | 1A |
| | | | | | 10M-100M | ±5% | | |
| 1/2W | 1206 | AQHP06 | 150V | 300V | 10M-54M | ±1% | ±200 | 2A |
| | | | | | 10M-100M | ±5% | | |
| 4/6W | 1210 | AQHP10 | 200V | 400V | 10M-54M | ±1% | ±200 | 2A |
| | | | | | 10M-100M | ±5% | | |
| 1W | 1812 | AQHP12 | 200V | 400V | 10M-54M | ±1% | ±200 | 2A |
| | | | | | 10M-100M | ±5% | | |
| 1W | 2010 | AQHP20 | 200V | 400V | 10M-54M | ±1% | ±200 | 2A |
| | | | | | 10M-100M | ±5% | | |
| 2W | 2512 | AQHP25 | 200V | 400V | 10M-54M | ±1% | ±200 | 2A |
| | | | | | 10M-100M | ±5% | | |
| Jumper Resistance Value: | | | | | 50m Ω Maximum | | | |
| Operating Temperature Range: | | | | | -55°C ~ +155°C | | | |

◆ POWER DERATING CURVE



Others data not in the specification of data, please contact us.

如果你要求的規格不在本規格書裡請與我們聯絡。

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AEC-Q200 High ohm Chip Resistor

Test Procedures and Requirements

| Test Item | Procedue | Requirement | Test Method |
|---|--|---|--------------------------|
| Temperature Coefficient of Resistance (T.C.R) | -55°C ~ +155°C, 20°C is the reference temperature | Refer to Rating | JIS C 5201-1 clause 4.8 |
| Short Time Overload | General: 2.5 time RCWV or Max. Overload voltage for 5 seconds. Hifh Power: 2.5 times RCWV of Mac. Overload voltage for 2 seconds. | ±1=±(1.0% +0.05Ω) ±5=±(2.0% +0.1Ω) | JIS C 5201-1 clause 4.13 |
| IR Reflow | <p>The graph shows a temperature profile for IR reflow. The y-axis represents temperature in degrees Celsius, ranging from 50 to 250. The x-axis represents time. Key points on the curve include: a heating time period starting from the beginning; a pre-heating zone starting at 150°C and ending at 180°C, with a duration of 90 ± 30 s; a soldering zone starting at 180°C and ending at 230°C or higher, with a duration of 30 ± 10 s; and a peak temperature of 250 ± 5°C.</p> | ±1=±(1.0% +0.05Ω) ±5=±(1.0% +0.05Ω) | SONY SS-00254 |
| Leaching | 260±5°C for 30 seconds | >95% Coverge | SONY SS-00254-9 |
| Soldering Heat | 260±5°C for 10 seconds | ±1=±(1.0% +0.05Ω) ±5=±(1.0% +0.05Ω) | JIS C 5201-2 clause 4.18 |
| Temperature Cycling | -55°C to +155°C 5 cycles | 0.10%,0.50%,1% : ±(0.1%+0.05Ω) 2%,5%: ±(0.1%+0.01Ω) | JIS C 5201-2 clause 4.19 |
| Electric Iron | Preheating temperature : 350±5°C Electric iron preheating time: 3+1/-0 second | ±1=±(1.0% +0.05Ω) ±5=±(1.0% +0.05Ω) | SONY SS-00254-5 |
| Resistance Solcent | The tested resistor be immersed into isproply alcohol of 20 ~ 25°C for 60 secs. Then the resistor is left in the room for 48 hours. | ±1=±(1.0% +0.05Ω) ±5=±(1.0% +0.05Ω) | JIS C 5201-1 clause 4.29 |
| Load life in Humidity | 40±2°C, 90-95% R.H. or Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF" | 0.10%,0.50%,1% : ±(0.1%+0.05Ω) 2%,5%: ±(2%+0.05Ω) | JIS C 5201-1 clause 4.24 |
| Load life (Endurance) | 70±2°C, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF" | 0.10%,0.50%,1% : ±(0.1%+0.05Ω) 2%,5%: ±(2%+0.05Ω) | JIS C 5201-1 clause 4.24 |
| Insulation Resistance | Max. Overload voltage for 1 mimute | ≥ 10G Ω | JIS C 5201-1 clause 4.6 |

* In case resistors operating ambient temperature in excess of the temperature range -55°C ~+155°C power ratio will be derated in accordance with the figure as shown on the right.

VOLTAGE RATING OR CURRENT RATING

Resistance Range: ≥ 1Ω

Rated Voltage: The resistor shall have a DC continuous working voltage or a RMS AC continuous working voltage at commercial-line frequency and wave form corresponding to the power rating, as determined formula as following:

$$E = \text{Rated voltage (V)} \quad E = \sqrt{R \times P} \quad P = \text{Power rating (W)} \quad R = \text{Nominal resistance (Ω)}$$

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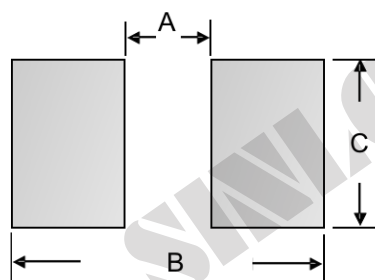
Reliability Test and Requirement

| Test Item | Procedure | Requirement | Test Method |
|-------------------------------------|---|--|-------------------------------|
| Temperature Cycling | 1000 Cycles (-55°C~+125°C) Measurement at 24±4Hrs afted test conclusion. | 0.1%,0.5%,1%:± (0.5%+0.05Ω).2%, 5%: ±(1.0%+0.1Ω) | JESD22 Method JA-104 |
| Resistance to Solvent | Add. Aqueous wash chemical-OKEM clean or equivalent. | ±1: ±(0.5% + 0.05Ω) ±5: ±(0.5% + 0.05Ω) | MIL-STD-202 Method 215 |
| Biased Humidity | 1000 hours 85°C/85%RH. | 0.1%,0.5%,1%:± (0.5%+0.05Ω).2%, 5%: ±(2%+0.05Ω) | MIL-STD-202 Method 103 |
| High Temperature Exposure (Storage) | 1000 hours @T=125°C | 0.1%,0.5%,1%:± (0.5%+0.05Ω).2%, 5%: ±(2%+0.05Ω) | MIL-STD-202 Method 108 |
| ◆ Tolerance: ±1% , ± | 125°C or Max. working voltage for 1000 hours with 1.5hrs [NO] and 0.5hrs [OFF] | 0.1%,0.5%,1%:± (0.5%+0.05Ω).2%, 5%: ±(3%+0.1Ω) | MIL-STD-202 Method 108 |
| External Visual | Electrical test not required. Inspect device construction, marking and workmanship. | | MIL-STD-883 Method 2009 |
| Mechanical Shock | Impact acceleration: 1500g Pulse duration: 0.5ms Number of shocks: 30 shocks (5 shocks for each face) | ±1: ± (1.0%+0.05Ω) ±5: ± (2.0%+0.1Ω) | MIL-STD-202 Method 213 |
| Vibration | 5g's for 20min, 12 cycles eath of 3 orientation | ±1: ± (1.0%+0.05Ω) ±5: ± (2.0%+0.1Ω) | MIL-STD-202 Method 204 |
| ESD | 2000V | For the product % | AEC-Q200-002 or ISO/DIS 10605 |
| Solderability | (1) 4hrs 155°C dry heat (2) 265± 5°C 10sec. | ±1: ± (0.5%+0.05Ω) ±5: ± (1.0%+0.05Ω) | J-STD-002 |
| Board Flex | Beading once for 60 seconds | ±1: ± (1.0%+0.05Ω) ±5: ± (1.0%+0.05Ω) | AEC-Q200-005 |

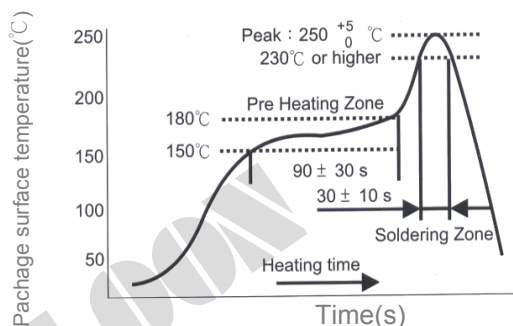
Recommend land pattern design (For reflow soldering)

| Size | A | B | C |
|------|------|------|------|
| 0603 | 0.80 | 2.40 | 1.00 |
| 0805 | 1.30 | 2.90 | 1.45 |
| 1206 | 2.20 | 4.20 | 1.80 |
| 1210 | 2.00 | 4.40 | 2.70 |
| 1812 | 3.11 | 5.91 | 3.20 |
| 2010 | 3.80 | 6.60 | 2.70 |
| 2512 | 4.90 | 8.10 | 3.40 |

unit: mm



Soldering Profile



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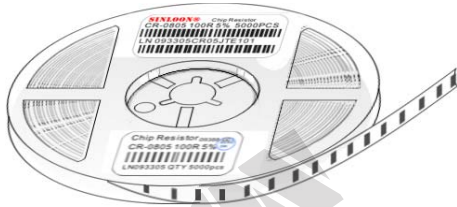
For Resistance According to IEC Publication 63

| E24 | | E96 | | | | | | | |
|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 10 | 33 | 100 | 133 | 178 | 237 | 316 | 422 | 562 | 750 |
| 11 | 36 | 102 | 137 | 182 | 243 | 324 | 432 | 576 | 768 |
| 12 | 39 | 105 | 140 | 187 | 249 | 332 | 442 | 590 | 787 |
| 13 | 43 | 107 | 143 | 191 | 255 | 340 | 453 | 604 | 806 |
| 15 | 47 | 110 | 147 | 196 | 261 | 348 | 464 | 619 | 825 |
| 16 | 51 | 113 | 150 | 200 | 267 | 357 | 475 | 634 | 845 |
| 18 | 56 | 115 | 154 | 205 | 274 | 365 | 487 | 649 | 866 |
| 20 | 62 | 118 | 158 | 210 | 280 | 374 | 499 | 665 | 887 |
| 22 | 68 | 121 | 162 | 215 | 287 | 383 | 511 | 681 | 909 |
| 24 | 75 | 124 | 165 | 221 | 294 | 392 | 523 | 698 | 931 |
| 27 | 82 | 127 | 169 | 226 | 301 | 402 | 536 | 715 | 953 |
| 30 | 91 | 130 | 174 | 232 | 309 | 412 | 549 | 732 | 976 |

PACKAGE SPECIFICATION

| Power | Size | Type | Quantity(ea) | | |  |
|-------|------|--------|--------------|---------|---------|--|
| | | | Paper Reel | Tape | In Box | |
| 1/8W | 0603 | AQHP03 | 5,000 Pcs | 7" Reel | 50K pcs | 300K pcs |
| 1/4W | 0805 | AQHP05 | 5,000 Pcs | 7" Reel | 50K pcs | 300K pcs |
| 1/2W | 1206 | AQHP06 | 5,000 Pcs | 7" Reel | 50K pcs | 300K pcs |
| 4/6W | 1210 | AQHP10 | 5,000 Pcs | 7" Reel | 50K pcs | 300K pcs |
| 1W | 1812 | AQHP12 | 5,000 Pcs | 7" Reel | 50K pcs | 300K pcs |
| 1W | 2010 | AQHP20 | 5,000 Pcs | 7" Reel | 50K pcs | 300K pcs |
| 2W | 2512 | AQHP25 | 4,000 Pcs | 7" Reel | 40K pcs | 240K pcs |

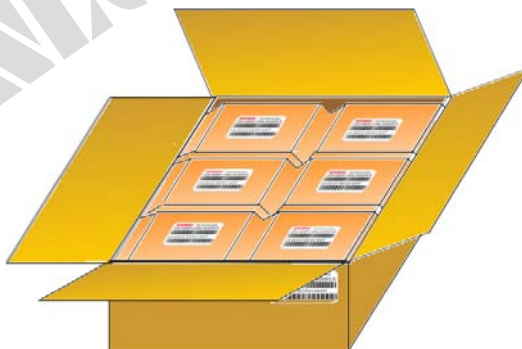
Plastic Reel



Inside box



Carton



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※ Mayloon characteristic parameters of electronic product specification changes or updates without prior notice.